

WHAT IS CLAIMED IS:

1. A method for routing calls in a packet-based network, comprising:

receiving a call request at a first call manager from  
5 a device coupled to the packet-based network, the call request including a telephone number associated with a plurality of telephony devices coupled to the packet-based network and controlled by a plurality of call managers;

determining a line control process associated with the  
10 telephone number included in the call request;

communicating the call request to the line control process;

determining a device process controlling each  
15 telephony device associated with the telephone number included in the call request; and

communicating the call request from the line control process to the device processes.

2. The method of Claim 1, wherein:

20 the packet-based network comprises an Internet Protocol (IP) network; and

the plurality of telephony device comprise IP telephony devices.

25 3. The method of Claim 1, wherein receiving a call request at a first call manager from a device coupled to the packet-based network comprises receiving a call request from a telephony device coupled to the packet-based network.

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4. The method of Claim 1, wherein receiving a call request at a first call manager from a device coupled to the packet-based network comprises receiving a call request from a gateway device coupled to the packet-based network, the gateway device receiving the call request from a telephony device external to the packet-based network.

5. The method of Claim 1, wherein:

determining a line control process associated with the telephone number included in the call request comprises accessing a registration information table to determine a process identification (PID) of the line control process; and

communicating the call request to the line control process comprises communicating the call request to the line control process using the PID.

6. The method of Claim 1, wherein communicating the call request to the line control process comprises communicating the call request to a line control process executing at a second call manager.

7. The method of Claim 1, wherein:

determining a device process controlling each telephony device comprises accessing a line control database associated with the line control process to determine a PID of each device process; and

communicating the call request from the line control process to the device processes comprises communicating the call request to the device processes using the PIDs of the device processes.

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8. The method of Claim 1, wherein communicating the call request from the line control process to the device processes comprises communicating the call request to the device processes in parallel.

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9. The method of Claim 1, wherein communicating the call request from the line control process to the device processes comprises communicating the call request to the device processes in series.

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10. The method of Claim 1, further comprising:  
communicating the call request from a device process to the telephony device controlled by the device process;  
receiving a call proceed signal from the telephony device indicating acceptance of the call request; and  
communicating the call proceed signal from the device process to the line control process.

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11. The method of Claim 10, further comprising establishing media streaming between the device from which the call request was received and the telephony device from which the call proceed signal was received.

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12. The method of Claim 1, further comprising:  
receiving a line registration request from a first telephony device requesting a line appearance associated with a first telephone number;

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determining that a line control process associated with the first telephone number has not been created; and  
creating a line control process associated with the first telephone number and operable to manage calls placed to the first telephone number.

13. The method of Claim 12, further comprising:  
communicating the PID of the line control process to  
a first device process controlling the first telephony  
device;

communicating the PID of the first device process to  
the line control process; and

storing the PID of the first device process in a line  
control database associated with the line control process.

14. The method of Claim 13, wherein:  
creating a line control process comprises creating a  
line control process executing at the first call manager;  
and

communicating the PID of the line control process to  
a first device process comprises communicating the PID of  
the line control process to a first device process  
executing at a second call manager.

15. The method of Claim 13, wherein:  
creating a line control process comprises creating a  
line control process executing at a second call manager;  
and

communicating the PID of the line control process to  
a first device process comprises communicating the PID of  
the line control process to a first device process  
executing at the first call manager.

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16. The method of Claim 13, further comprising:  
receiving a line registration request from a second  
telephony device requesting a line appearance associated  
with the first telephone number;

5 determining that a line control process associated  
with the first telephone number has already been created;

communicating the PID of the line control process  
associated with the first telephone number to a second  
device process controlling the second telephony device;

10 communicating the PID of the second device process to  
the line control process; and

storing the PID of the second device process in the  
line control database associated with the line control  
process.

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17. A method for routing calls in a packet-based network, comprising:

receiving a call request at a first call manager from a device coupled to the packet-based network, the call request including a telephone number associated with a plurality of telephony devices coupled to the packet-based network and controlled by a plurality of call managers;

determining the location of a plurality of line control processes associated with the telephone number included in the call request, each line control process executing at a different call manager; and

communicating the call request to the line control processes.

18. The method of Claim 17, wherein:

the packet-based network comprises an Internet Protocol (IP) network; and

the plurality of telephony device comprise IP telephony devices.

19. The method of Claim 17, wherein receiving a call request at a first call manager from a device coupled to the packet-based network comprises receiving a call request from a telephony device coupled to the packet-based network.

20. The method of Claim 17, wherein receiving a call request at a first call manager from a device coupled to the packet-based network comprises receiving a call request from a gateway device coupled to the packet-based network, the gateway device receiving the call request from a telephony device external to the packet-based network.

21. The method of Claim 17, wherein:

determining the location of a plurality of line control process associated with the telephone number included in the call request comprises accessing a registration information table to determine a process identification (PID) of each line control process; and

communicating the call request to the line control processes comprises communicating the call request to the line control processes using the PIDs of the line control processes.

22. The method of Claim 17, wherein communicating the call request to the line control processes comprises communicating the call request to at least one line control process executing at a call manager other than the first call manager.

23. The method of Claim 17, wherein communicating the call request to the line control processes comprises communicating the call request to the line control processes in parallel.

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24. The method of Claim 17, wherein communicating the call request to the line control processes comprises communicating the call request to the line control processes in series.

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25. The method of Claim 17, further comprising:

communicating the location of the plurality of line control processes to a first lock manager associated with a first line control process;

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communicating a lock request signal from the first lock manager associated with the first line control process to each of the other line control processes associated with the telephone number included in the call request;

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communicating the lock request signal from each of the other line control processes to an lock manager associated with each line control process;

receiving a lock response at each of the other line control process from the associated lock manager; and

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communicating the lock response from each line control process to the first lock manager.

26. The method of Claim 25, wherein:

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receiving a lock response at each line control process from the associated lock manager comprises receiving a response indicating the lock request has been granted; and

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communicating the call request to the line control processes comprises communicating the call request to the line control processes in response to receiving the lock response from each line control process at the first lock manager.

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27. The method of Claim 17, further comprising:

determining the location of at least one device process associated with each line control process, each device process controlling a telephony device associated with the telephone number included in the call request; and

communicating the call request from each line control process to the associated device process.

28. The method of Claim 27, wherein:

determining the location of at least one device process comprises accessing a line control database associated with the line control process to determine a PID of the device process; and

communicating the call request from the line control process to the device process comprises communicating the call request to the device process using the PID of the device process.

29. The method of Claim 27, further comprising:

communicating the call request from the device process to the telephony device controlled by the device process;

receiving a call proceed signal from the telephony device indicating acceptance of the call request; and

communicating the call proceed signal from the device process to the line control process.

30. The method of Claim 29, further comprising establishing media streaming between the device from which the call request was received and the telephony device from which the call proceed signal was received.

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31. The method of Claim 17, further comprising:  
receiving a line registration request at the first  
call manager from a first telephony device requesting a  
line appearance associated with a first telephone number;  
5 determining that a line control process associated  
with the first telephone number has not been created at the  
first call manager; and  
creating a first line control process at the first  
call manager associated with the first telephone number and  
operable to manage calls placed to the first telephone  
10 number.

32. The method of Claim 31, further comprising:  
communicating the PID of the first line control  
15 process to a first device process controlling the first  
telephony device;  
communicating the PID of the first device process to  
the first line control process; and  
storing the PID of the first device process in a first  
20 line control database associated with the first line  
control process.

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33. The method of Claim 31, further comprising:  
receiving a line registration request at a second call  
manager from a second telephony device requesting a line  
appearance associated with the first telephone number;  
5 determining that a line control process associated  
with the first telephone number has not been created at the  
second call manager; and  
creating a second line control process at the second  
call manager associated with the first telephone number and  
10 operable to manage calls placed to the first telephone  
number.

34. The method of Claim 33, further comprising:  
communicating the PID of the second line control  
15 process to a second device process controlling the second  
telephony device;  
communicating the PID of the second device process to  
the second line control process; and  
storing the PID of the second device process in a  
20 second line control database associated with the second  
line control process.

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35. The method of Claim 31, further comprising:  
receiving a line registration request at the first  
call manager from a second telephony device requesting a  
line appearance associated with the first telephone number;  
5 determining that the first line control process is  
already associated with the first telephone number;  
communicating the PID of the first line control  
process to a second device process controlling the second  
telephony device;  
10 communicating the PID of the second device process to  
the first line control process; and  
storing the PID of the second device process in a  
first line control database associated with the first line  
control process.

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36. A call manager for routing calls in a packet-based network, comprising:

a first device process controlling a first device coupled to the packet-based network and operable to receive a call request from the device, the call request including a first telephone number associated with a plurality of telephony devices coupled to the packet-based network and controlled by a plurality of call managers;

a call control module operable to receive the call request from the first device process;

a digit analysis module operable to:

receive the first telephone number from the call control module;

determine the location of a line control process associated with the first telephone number; and

communicate the location of the line control process to the call control module; and

a line control process operable to:

receive the call request from the call control module;

determine the location of a plurality of device process, each device process controlling a telephony device associated with the first telephone number; and

communicate the call request to the device processes.

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37. The call manager of Claim 36, wherein:  
the packet-based network comprises an Internet  
Protocol (IP) network; and

5 the plurality of telephony device associated with the  
telephone number in the call request comprise IP telephony  
devices.

10 38. The call manager of Claim 36, wherein the first  
device process controls a first telephony device coupled to  
the packet-based network and is operable to receive a call  
request from the first telephony device.

15 39. The call manager of Claim 36, wherein the first  
device process controls a first gateway device coupled to  
the packet-based network and is operable to receive a call  
request from the first gateway device, the first gateway  
device having received the call request from a telephony  
device external to the packet-based network.

20 40. The call manager of Claim 36, wherein:  
the digit analysis module is further operable to  
access a registration information table to determine a  
process identification (PID) of the line control process;  
and

25 the call control module is operable to communicate the  
call request to the line control process using the PID.

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41. The call manager of Claim 36, wherein the line control process is further operable to:

access an associated line control database to determine a PID of each device process controlling a telephony device associated with the first telephone number; and

communicate the call request to the device processes using the PIDs of the device processes.

42. The call manager of Claim 36, wherein the line control process is operable to communicate the call request to the device processes in parallel.

43. The call manager of Claim 36, wherein the line control process is operable to communicate the call request to the device processes in series.

44. The call manager of Claim 36, wherein each device process controlling a telephony device associated with the first telephone number is further operable to:

communicate the call request to the telephony device controlled by the device process;

receive a call proceed signal from the telephony device indicating acceptance of the call request; and

communicate the call proceed signal to the line control process.

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45. The call manager of Claim 44, wherein the call control module is further operable to:

receive the call request from the line control process; and

5 establish media streaming between the first device and the telephony device from which the call proceed signal was received.

10 46. The call manager of Claim 36, further comprising a line manager operable to receive a line registration request from a second telephony device requesting a line appearance associated with the first telephone number.

15 47. The call manager of Claim 46, wherein:  
the digit analysis module is further operable to receive the first telephone number from the line manager and to determine that a line control process associated with the first telephone number has not been created; and  
20 wherein the line manager is further operable to create a line control process associated with the first telephone number.

25 48. The call manager of Claim 47, wherein:  
the line manager is further operable to communicate the PID of the line control process to a second device process controlling the second telephony device; and  
the line control process is operable to receive a PID of the second device process from the second device process and to store the PID of the second device process in a line  
30 control database associated with the line control process.

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49. The call manager of Claim 48, wherein the line control process is further operable to:

receive the PID of a third device process controlling a third telephony device requesting a line appearance associated with the first telephone number, the third device process executing at a second call manager and having received the PID of the line control process from a line manager executing at the second call manager; and

store the PID of the third device process in the line control database associated with the line control process.

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50. A call manager for routing calls in a packet-based network, comprising:

a first device process controlling a first device coupled to the packet-based network and operable to receive a call request from the first device, the call request including a first telephone number associated with a plurality of telephony devices coupled to the packet-based network and controlled by a plurality of call managers;

a call control module operable to receive the call request from the first device process;

a digit analysis module operable to:

receive the first telephone number from the call control module;

determine the location of a plurality of line control process associated with the first telephone number, each line control process executing at a different call manager; and

communicate the location of the line control processes to the call control module; and

the call control module further operable to communicate the call request to the line control processes.

51. The call manager of Claim 50, wherein:

the packet-based network comprises an Internet Protocol (IP) network; and

the plurality of telephony device associated with the telephone number in the call request comprise IP telephony devices.

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52. The call manager of Claim 50, wherein the first device process controls a first telephony device coupled to the packet-based network and is operable to receive a call request from the first telephony device.

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53. The call manager of Claim 50, wherein the first device process controls a first gateway device coupled to the packet-based network and is operable to receive a call request from the first gateway device, the first gateway device having received the call request from a telephony device external to the packet-based network.

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54. The call manager of Claim 50, wherein:

the digit analysis module is further operable to access a registration information table to determine a process identification (PID) of each line control process; and

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the call control module is operable to communicate the call request to the line control processes using the PIDs of the line control processes.

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55. The call manager of Claim 50, wherein the call control module is operable to communicate the call request to the line control processes in parallel.

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56. The call manager of Claim 50, wherein the call control module is operable to communicate the call request to the line control processes in series.

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57. The call manager of Claim 50, further comprising:  
a first line control process associated with the first  
telephone number and operable to receive the location of  
the other line control processes associated with the first  
5 telephone number from the call control module; and  
a lock manager operable to:  
receive the location of the other line control  
processes;  
communicate a lock request signal to each of the  
10 other line control processes;  
receive a lock response from each line control  
process indicating that a lock manager associated with each  
of the other line control processes has granted the lock  
request; and  
15 communicate the lock response from each line  
control process to the first line control process.

58. The method of Claim 57, wherein:  
the first line control process is further operable to  
20 communicate a signal to the call control module indicating  
that the lock request has been granted by each of the  
plurality of line control process associated with the first  
telephone number; and  
the call control module is operable to communicate the  
25 call request to each of the line control processes in  
response to receiving the signal from the first line  
control process.

59. The call manager of Claim 58, further comprising:  
a second device process controlling a second telephony  
device associated with the telephone number included in the  
call request; and

5 wherein the first line control process is further  
operable to:

receive the call request from the call control  
module;

10 determine the location of a second device  
process; and

communicate the call request to the second device  
process.

60. The call manager of Claim 59, wherein the first  
15 line control process is further operable to:

access a line control database associated with the  
first line control process to determine a PID of the second  
device process; and

20 communicate the call request to the second device  
process using the PID.

61. The call manager of Claim 60, wherein the second  
device process is operable to:

25 communicate the call request to the second telephony  
device;

receive a call proceed signal from the second  
telephony device indicating acceptance of the call request;  
and

30 communicate the call proceed signal to the first line  
control process.

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62. The call manager of Claim 61, wherein the call control module is further operable to establish media streaming between the first device and the second telephony device.

63. The call manager of Claim 50, further comprising a line manager operable to receive a line registration request from a second telephony device requesting a line appearance associated with the first telephone number.

64. The call manager of Claim 63, wherein:  
the digit analysis module is further operable to receive the first telephone number from the line manager and to determine that a line control process associated with the first telephone number has not been created; and  
wherein the line manager is further operable to create the first line control process associated with the first telephone number.

65. The call manager of Claim 64, wherein:  
the line manager is further operable to communicate the PID of the first line control process to the second device process controlling the second telephony device; and  
the first line control process is operable to receive a PID of the second device process from the second device process and to store the PID in a line control database associated with the first line control process.

~~66~~ 66. Call manager software embodied in a computer-readable medium and operable to perform the following steps:

5 receiving a call request from a device coupled to the packet-based network, the call request including a telephone number associated with a plurality of telephony devices coupled to the packet-based network and controlled by a plurality of call managers;

10 determining a line control process associated with the telephone number included in the call request;

communicating the call request to the line control process;

15 determining a device process controlling each telephony device associated with the telephone number included in the call request; and

communicating the call request from the line control process to the device processes.

67. The call manager software of Claim 66, wherein:

20 determining a line control process associated with the telephone number included in the call request comprises accessing a registration information table to determine a process identification (PID) of the line control process; and

25 communicating the call request to the line control process comprises communicating the call request to the line control process using the PID.

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68. The call manager software of Claim 66, wherein communicating the call request to the line control process comprises communicating the call request to a line control process executed by a second call manager software.

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69. The call manager software of Claim 66, wherein:  
determining a device process controlling each telephony device comprises accessing a line control database associated with the line control process to determine a PID of each device process; and

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communicating the call request from the line control process to the device processes comprises communicating the call request to the device processes using the PIDs of the device processes.

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70. The call manager software of Claim 66, further operable to:

receive a line registration request from a first telephony device requesting a line appearance associated with a first telephone number;

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determine that a line control process associated with the first telephone number has not been created; and

create a line control process associated with the first telephone number and operable to manage calls placed to the first telephone number.

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71. The call manager software of Claim 70, further operable to:

communicate the PID of the line control process to a first device process controlling the first telephony device;

communicate the PID of the first device process to the line control process; and

store the PID of the first device process in a line control database associated with the line control process.

72. The call manager software of Claim 71, wherein: creating a line control process comprises creating a line control process executed by the call manager software; and

communicating the PID of the line control process to a first device process comprises communicating the PID of the line control process to a first device process executed by a second call manager software.

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73. A call manager for routing calls in a packet-based network, comprising:

means for receiving a call request from a device coupled to the packet-based network, the call request including a telephone number associated with a plurality of telephony devices coupled to the packet-based network and controlled by a plurality of call managers;

means for determining a line control process associated with the telephone number included in the call request;

means for communicating the call request to the line control process;

means for determining a device process controlling each telephony device associated with the telephone number included in the call request; and

means for communicating the call request from the line control process to the device processes.

74. The call manager of Claim 73, further comprising:

means for accessing a registration information table to determine a process identification (PID) of the line control process; and

means for communicating the call request to the line control process comprises communicating the call request to the line control process using the PID.

75. The call manager of Claim 73, further comprising means for communicating the call request to a line control process executed by a second call manager.

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76. The call manager of Claim 73, further comprising:  
means for accessing a line control database associated  
with the line control process to determine a PID of each  
device process; and

5 means for communicating the call request to the device  
processes using the PIDs of the device processes.

77. The call manager of Claim 73, further comprising:  
means for receiving a line registration request from  
10 a first telephony device requesting a line appearance  
associated with a first telephone number;

means for determining that a line control process  
associated with the first telephone number has not been  
created; and

15 means for creating a line control process associated  
with the first telephone number and operable to manage  
calls placed to the first telephone number.

78. The call manager of Claim 77, further comprising:  
20 means for communicating the PID of the line control  
process to a first device process controlling the first  
telephony device;

means for communicating the PID of the first device  
process to the line control process; and

25 means for storing the PID of the first device process  
in a line control database associated with the line control  
process.

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